DOCUMENT RESUME

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Guidelines for Planning Colleges of Applied Arts and Technology, Including Approval Procedures. Revised April 1968.

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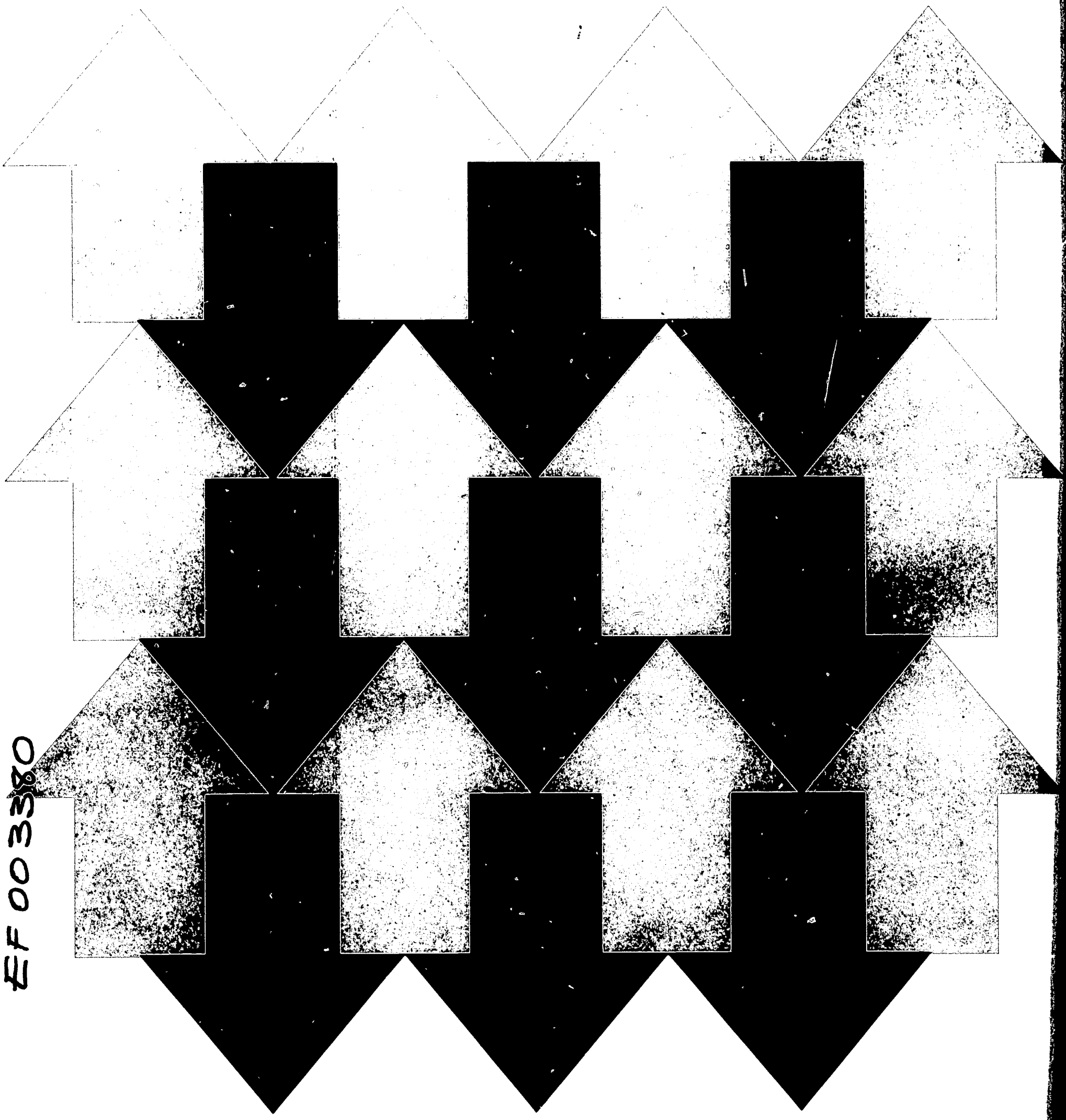
Descriptors-*College Planning, *Community Colleges, Critical Path Method, Educational Programs, Educational Specifications, *Facility Guidelines, *Facility Requirements, *Post Secondary Education, Site Analysis

Regulations are presented pertaining to the planning and construction of colleges of applied arts and technology including basic principles involved in planning such facilities. Material from a wide variety of sources is condensed in outline form regarding the following topics--(1) college students, staff, programs, (2) the area and its needs, (3) educational requirements, (4) educational specifications, (5) site selection and development, (6) planning, (7) critical path planning and time scheduling, (8) selection and role of consultants, and (9) costs. Sample forms for utilization in approval procedures are included. (FS)

Guidelines for planning

Colleges of Applied Arts and Technology

Including approval procedures



Prepared by
the Ontario Department of Education
Division of School Planning and Building Research
In conjunction with
the Applied Arts and Technology Branch
October 1967
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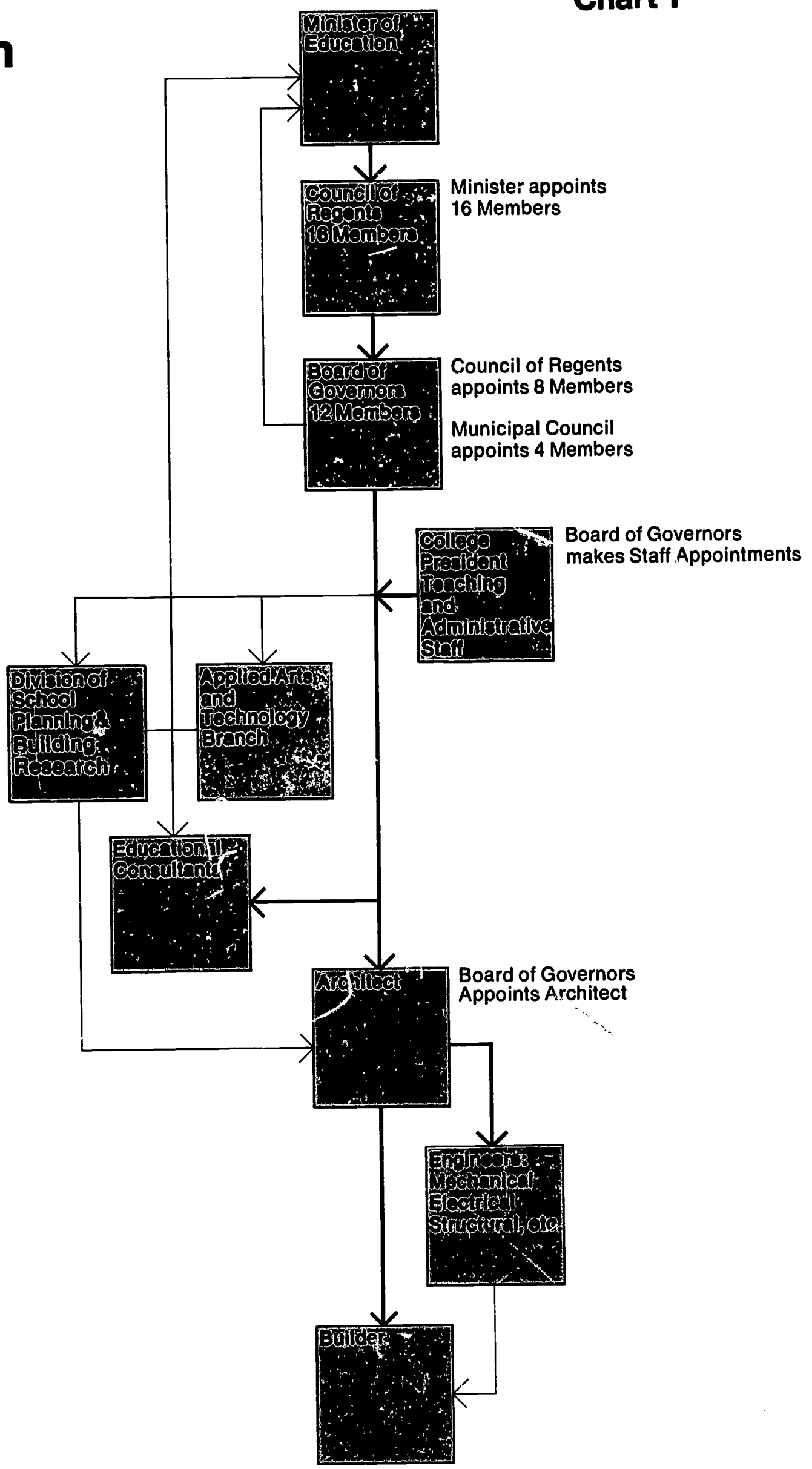
Structure of Organization

Chart 1



Introduction

The intent of this booklet is to acquaint local planners, Boards of Governors, administrators, standing committees, architects and other interested persons with the aspects of the regulations which pertain to the planning and construction of Colleges of Applied Arts and Technology and with the basic principles involved in planning such facilities. Material has been obtained from a wide variety of sources and condensed in outline form deliberately to serve as a ready reference, particularly for those individuals or groups who might be involved in the early stages of planning. The booklet Colleges of Applied Arts and Technology – Basic Documents June 1967 should be consulted for details of the regulations etc.

This booklet will provide answers or references to such questions as the following:

What is a College of Applied Arts and Technology? What programs does it offer and who does it serve?
See Basic Documents

What programs of instruction should be considered or included in an educational program?
See Basic Documents

How does a planning group determine the educational programs and facilities needed in its district or area?
See section 3

What facilities are needed to carry out the program and who prepares this information?
See section 4

What kinds of information does the architect need to design a building effectively and efficiently? Who prepares the information?
See section 5

What factors are involved in site selection and master planning?
See section 6

What general building design considerations should the board and planning groups be aware of?
See section 7

What are the detailed facilities planning requirements to be considered?
See section 7

What is the sequence of events in planning and constructing college facilities?
See section 7

How can scheduling for all stages of the work be controlled?
See section 8

What is the role of the architect and the various consultants, how are they appointed and what are their responsibilities?
See section 9

How is the program to be financed?
See section 10

How are the construction costs measured? What variables should be considered in estimating costs?
See section 10

In preparing a capital outlay budget for construction, what items should be included?
See section 10

How and in what ways can construction costs be kept down?
See section 10

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See section 10

What approvals are necessary and what forms are required to obtain these?
See section 11

What are the terms and expressions used in this field of education?
See section 12

Where can additional information about facilities planning be obtained?
See section 13

Structure of Organization
Who are the bodies involved in the creation and building of a college?
See chart 1 (previous page)

Area Map
What are the college areas in Ontario?
See chart 2 page 6

Educational Flow Chart
Who is eligible for the college programs and what qualifications are required for entry?
See chart 3 page 8

Participation Chart
What parts do the various members of the team play in the project?
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Educational Area Breakdown
What facilities are required to accommodate the various programs?
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See chart 6 page 15

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Space Relationship and Planning
What are the relationships between the various areas of the building?
See charts 7 and 8 pages 17 and *21*

Approvals
What approvals are necessary and who gives them?
See chart 9 page 28

Documents and Content
What documents have to be prepared, who prepares and approves them and what are their content?
See chart 10 page 42

College—Students—Staff—Programs

The College
A College of Applied Arts and Technology is a post secondary educational institution established for youth and adults to continue their practical and formal education in a wide variety of fields in courses varying in length from a few weeks to three years.

The Students
There are three groups of potential students:
Students who complete Grade 12, but who do not go on to Grade 13 and university.

Out-of-school youth
The many students who leave secondary school before graduation from any program often find, after a very short time, that further education is necessary. These students will, undoubtedly, require make-up courses in the college setting before they qualify for the college program of their choice.

Mature adults
Admission of mature students is determined mainly by their potential rather than their earlier school standing only.

Subject to the conditions outlined in the publications of the Board of Governors of each college:
Any person who is a holder of an Ontario Secondary School graduation diploma obtained at the end of Grade 12 from any Branch or Program;

or
Any person who is a holder of an Ontario Secondary School Honour graduation diploma obtained after completion of Grade 13;

or
Any person who has attained the age of nineteen years on or before the date of commencement of the program of instruction in which he plans to enrol shall be admitted to the appropriate program of instruction, upon the payment of a fee as required.

The Programs
Normally, the "appropriate" program would be:
A three-year program in any division for a student graduating from the fourth year of a five-year Secondary School program with a 60% average or better in the mathematical, scientific, English and social science courses; or a graduate of a four-year Secondary School program with a 70% average or better in the mathematical, scientific, English, and social science courses.

A one- or two-year program in any division for a student graduating from the fourth year of a four-year Secondary School program.

An academic upgrading program for youths and adults whose present formal qualifications do not meet the above standards.

A general education program for youths and adults who may wish to obtain equivalent university entrance standing.

The programs of instruction in a College of Arts and Technology may be grouped into four major divisions:

A Technological and Technical Division offering programs ranging from three-year programs in engineering technology, through two-year technician programs, to "sandwich" programs to provide the in-school training for apprentices.

A Business Division offering three-year programs in Business Administration and two-year programs in the various facets of the business world such as accounting, data processing, marketing, institutional and resort management, etc.

An Applied Arts Division which will offer one-, two- and three-year programs in such applied arts as journalism, social welfare, recreation director, etc. This division will also provide liberal arts courses to students in other divisions in order to maintain breadth as well as depth in their educational experience.

A fourth division of the college program is the Extension or Continuing Education Division which will offer to part-time students a wide variety of short programs, in addition to the programs available to full-time students.

The Staff

To carry out such a diversified educational program effectively, the teaching staff of a College of Applied Arts and Technology is made up of dedicated people with a wide variety of educational qualifications and experience. Qualifications will range from skilled craftsmen and the experienced journeymen teaching shop courses, through technologists and other graduates of three-year college programs who return from industry to teach the two-year college programs, university graduates with pass and honour degrees in humanities and social sciences, to those with professional degrees and industrial or business experience who instruct students in the three-year programs.

Some college masters will come from other types of teaching experience, either at the secondary school or university level. But most of the instructional staff will come directly from business or industry, attracted by the challenge of an opportunity to teach adult and young adult students.

Community

In many communities the college may become an important focal point for cultural community and recreational activities.

The college buildings will have accommodation that can be used to advantage by the community. By making these facilities available a sense of identity is built up between the college and the community,and a better utilisation of the buildings is achieved.

AA&T College Areas Ontario

Area 1
to serve all the municipalities, including any cities or separated towns, within the counties of
Renfrew
Lanark
Carleton
Russell
Prescott

Area 2
to serve all the municipalities, including any cities or separated towns, within the counties of
Frontenac
Leeds
Grenville
Dundas
Stormont
Glengarry

Area 3
to serve all the municipalities, including any cities or separated towns, within the counties of
Lennox and Addington
Hastings
Prince Edward
Northumberland
Peterborough
Haliburton
Victoria

Area 4
to serve all the municipalities, including any cities or separated towns, within the counties of
Ontario
Durham

Area 5
to serve the municipalities of
The Township of Scarborough
The Township of East York and
The Town of Leaside

Area 6
to serve the municipalities of
The Township of Etobicoke
The Township of York
and the Towns of Mimico, New Toronto and Weston and the Village of Long Branch

Area 7
to serve the Township of North York and all the municipalities within the County of York that do not form part of the present Metropolitan Toronto area

Area 8
to serve all the municipalities, including any cities or separated towns, within the counties of
Peel
Halton

Area 9
to serve all the municipalities, including any cities or separated towns, within the counties of
Wentworth
Brant
and the Townships of Oneida, Seneca, N. Cayuga, Walpole and Rainham in the County of Haldimand and any urban municipalities within the boundaries of those townships and the townships of N. Grimsby, S. Grimsby and Caistor in the County of Lincoln and any urban municipalities within the boundaries of those townships

Area 10
to serve all the municipalities, including any cities or separated towns, within the county of
Welland
and the Townships of Niagara, Grantham, Louth, Clinton and Gainsborough in the County of Lincoln and any urban municipalities within the boundaries of those townships and the Townships of Moulton, Sherbrooke, Dunn, Canborough and S. Cayuga in the County of Haldimand and any urban municipalities within the boundaries of those townships

Area 11
to serve all the municipalities, including any cities or separated towns, within the counties of
Middlesex
Elgin
Norfolk
Oxford

Area 12
to serve all the municipalities, including any cities or separated towns, within the counties of
Essex
Kent

Area 13
to serve all the municipalities, including any cities or separated towns, within the county of
Lambton

Area 14
to serve all the municipalities, including any cities or separated towns, within the counties of
Huron
Perth
Waterloo
Wellington

Area 15
to serve all the municipalities, including any cities or separated towns, within the counties of
Bruce
Grey
Dufferin
Simcoe
and the districts of
Muskoka
Parry Sound

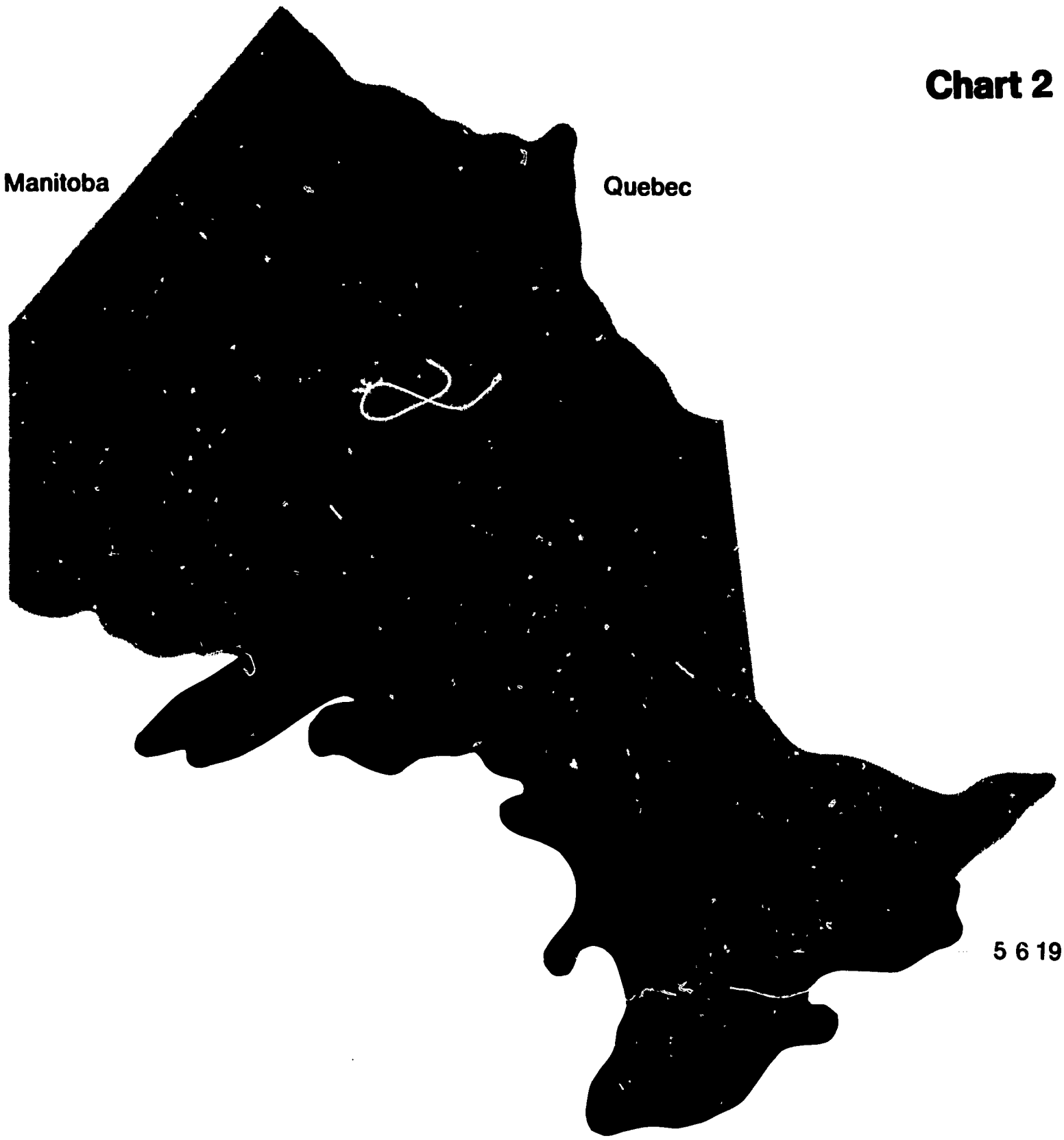
Area 16
to serve all the municipalities, including any cities or separated towns, within the districts of
Algoma
Manitoulin
Sudbury
Nipissing

Area 17
to serve all the municipalities, including any cities or separated towns, within the districts of
Cochrane
Timiskaming

Area 18
to serve all the municipalities, including any cities or separated towns, within the districts of
Kenora
Rainy River
Thunder Bay

Area 19
established by an Order-in-Council of July 14, 1966, to serve the City of Toronto
the Village of Forest Hill
the Village of Swansea

Chart 2



3

The Area–Its Needs

The nature of the college is dependent on many factors such as the history and background of the community, industrial development, long established industries or developing industries, forestry, type of agriculture, natural resources, etc. These will determine the needs and character of the college.

"Upon assuming office, a Board of Governors shall make a study of the post-secondary and adult education needs of the area." Regulation 4(1)

Survey

The survey is necessary in order to provide essential information, for analyses, on which to base decisions for the educational program.

To propose a program to meet these requirements.

To determine the facilities (site, building, furniture and equipment) needed to accommodate the proposed program.

Questions to be answered

What is the potential supply of students from:

– Grade 12 of the 4-year Program?
– Grade 12 of the 5-year Program?
– Age 19 or over group?

What educational programs should be offered?

What are the present and future populations and population growth pattern?

What are the existing and potential business and industrial resources needs and interests?

What businesses and industries are presently in operation?

What new industries are growing in the area or could be successfully attracted to the area?

What will this mean in terms of job retraining and upgrading requirements?

What are the types of jobs available and the number of graduates needed to fill them?

What educational programs should be offered?

What community interest is there in part-time programs?

What interest is expressed by associations and societies in special courses?

What is the potential for expansion or diversification?

What are the implications for training or retraining?

What are the implications for general education?

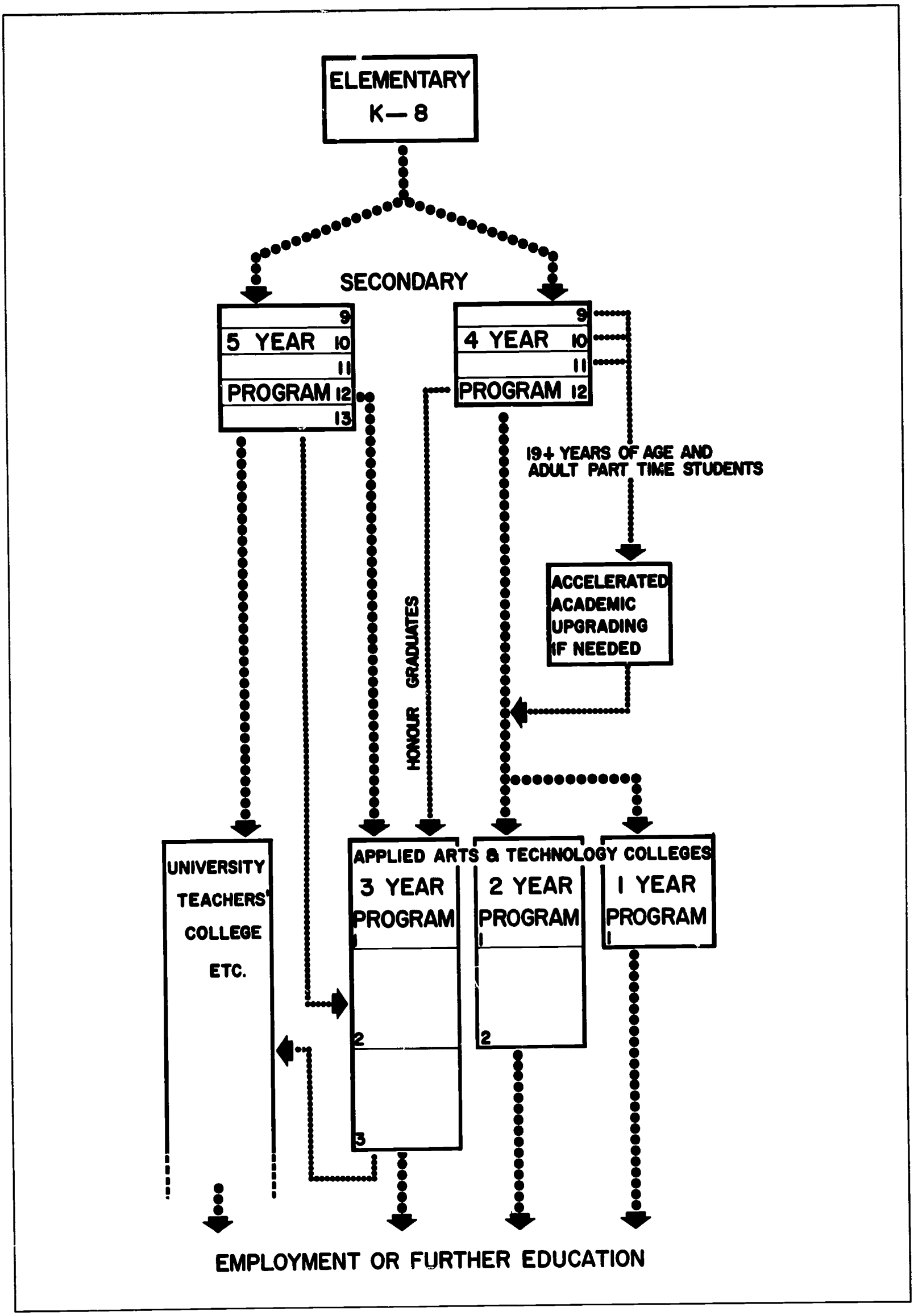
What are the immediate and long-range program and facilities needs? How can the planning for both best be co-ordinated?

How many students are to be accommodated?

What other post-secondary educational facilities are presently available?

Educational Flow Chart

Chart 3



Participation Chart

Chart 4

Board of Governors

Study area needs:

Appoint president and senior staff

Appoint advisory committees for program requirements

Prepare educational program

Select and purchase site

Appoint architect

Call tenders

Award contract

Administer financing, etc.

Advisory Committees

General advice on college programs

College President & Senior Staff

Work with A.A. & T. staff members and educators on requirements

Provide detailed information on specific areas of college,labs., etc.

Educational Consultants

Advise on educational requirements

New educational methods

Educational planning

Applied Arts and Technology Branch

Available for consultation and advice at all stages

Division of School Planning & B.R.

Available for consultation and advice on the following:

- Researching similar facilities
- Educational consultants requirements
- Preparation of critical path program
- Preparation of plant specifications
- Construction cost factors

Consultants:
Quantity Surveyor
Structural
Mechanical
Electrical
Landscape, etc.

Prepare all necessary drawings, calculations, specifications, estimates in collaboration with architect

Architect

Study educational requirements:

Visit/research similar projects

Clarify requirements in conjunction with educational consultants

Building requirements in conjunction with structural, mechanical and electrical consultants

Prepare the following:

- Sketch plans and cost estimates
- selection of materials
- working drawings, specifications and cost estimates
- colour schemes, furniture, etc., as required
- Approvals from municipality, fire marshall, health department, etc.
- Supervision
- Change orders, etc.
- Payment certificates

Educational Requirements

The education program will be established from the information gathered in the area survey.

This will define General Courses to be offered:

Advanced courses
Night courses
Extension courses
Adult education and retraining courses, etc.

Enrolment

When the educational program and types of courses have been established the next step is to assess the accommodation required to carry out the program.

It is most important that enrolment, both initial and future, be correctly assessed so that the education specification can be accurately developed.

It should be noted that there are generally more students in the night school programs than in the day courses.

Student numbers

The minimum full-time student enrolment should be 175 – 200 students to make the college feasible both economically and educationally.

It may initially be necessary to provide a college for less than this number in some areas.

The college will require about 1,000 students to be completely self-sufficient.

Educational Philosophy

This has to be broken down into:

Length of the various courses

Size of classes for the programs

Mix of teaching methods – lecture, tutorial, laboratory, closed or open circuit educational TV, individual study

Time requirements for the various courses in lectures, classrooms, labs, shops, library, etc.

Physical Education Program

Anticipated extra curricular activities

Other

Food service in number of meals, type of meals, use as a community facility

In addition to the educational requirements there are additional requirements

Administrative areas

Service areas

Community Facilities requirements

All this information is detailed in the Educational Specification.

Educational Areas

Chart 5

PRESENT and FUTURE ENROLMENT

PROGRAM SPACE REQUIREMENTS

TOTAL.SHARED PRESENT and FUTURE SPACE REQUIREMENTS

EDUCATIONAL AREAS BREAKDOWN OF REQUIREMENTS	ENROLLMENT PRESENT DAY	ENROLLMENT PRESENT NIGHT	ENROLLMENT FUTURE DAY	ENROLLMENT FUTURE NIGHT	
DEPT. A 60 | 90	60	30	90	100	APPLIED ARTS PROGRAM
DEPT. B 35 | 85	35	0	85	30	
DEPT. C 85 | 130	85	30	130	120	
DEPT. D 110 | 140	110	60	140	150	
DEPT. E 80 | 120	80	0	120	50	
5 2 5 1 5 4 6 2					
TOTAL	370	120	565	450	
DEPT. F 50 | 95	50	30	95	120	TECHNOLOGY PROGRAM
DEPT. G 95 | 130	95	30	130	150	
DEPT. H 90 | 140	90	45	140	150	
DEPT. I 65 | 105	65	20	105	100	
2 7 4 0 2 6 3 1					
TOTAL	300	125	470	520	
DEPT. J 80 | 140	80	60	140	180	BUSINESS ADMIN. PRO.
DEPT. K 65 | 115	65	30	115	120	
2 0 6 1 2 0 4 1					
TOTAL	145	90	255	300	
GRAND TOTAL	815	335	1290	1270	

KEY TO AREA SYMBOLS				OCCUPANCY	
PRESENT	FUTURE			PRES.	FUT.
9	9	LABORATORY	GENERAL OFFICES	8	13
9	10	WORKSHOP	SINGLE STAFF OFFICES	5	7
15	13	CLASSROOM	SHARED STAFF OFFICES	10	20
2	4	ELECTRONIC TEACHING AREA	DINING AREA	250	600
1	2	LARGE LECTURE ROOM	AUDITORIUM		500
3	4	SMALL LECTURE ROOM	AUD / GYM		
12	12	SEMINAR ROOM	SINGLE GYMNASIUM		
1	3	SPECIAL TEACHING AREAS	DOUBLE GYMNASIUM		
		CENTRAL LIBRARY	DEPARTMENTAL LIBRARY		

Education Specification

Definition
Detailed written description of education program, philosophy and facilities needed to meet the program.

Prepared by
College President

Sources of information
The area study
Applied Arts and Technology Branch
Division of School Planning
Senior College staff
Advisory Committees
Educational consultants

Content
General requirements

Philosophy and objectives of College

Description of operation of College

Community facility objectives

Night courses

Adult education courses, etc.

General planning and space information
Space requirements for each Department

Labs, shop, classrooms, etc.

Outside work areas

Space requirements for lectures, etc.

Other teaching spaces required

Library and Resource Centre requirements

Requirements for gymnasiums, recreation areas, etc.

Requirements for administration areas

Office, staff, health, guidance, etc. requirements

Requirements for food service areas

Requirements for auditorium

Servicing shops, etc.

Central storage and receiving

Separate storage requirements

Departmental offices and staff requirements

Custodial and janitors' storage requirements

Parking requirements (staff, students, guests)

Relationship of all areas

Special access requirements

Future area relationships

Services
Detailed information on services for areas:
General utilities in each area

Special utilities for each area

Special test areas, etc. within each area

Special safety equipment required in each area

Special soundproofing for quiet or to confine noise

Special electrical screening, etc. in each area

Special environmental requirements

Custodial requirements

Materials
Information on suitable materials for shops, labs, furniture, etc.

Plant Specification

Definition
Detailed written description of the areas, spaces, buildings, etc. required to accommodate the education requirements. Prepared from the Education Specification.

Purpose
To provide the planning consultants and architect with detailed information to produce sketch plans and cost estimates.

Prepared by
Architect in consultation with DSP & BR

Content
Site use and development:
General area relationships
Area relationship diagrams

Areas required to accommodate education specification requirements for each area (Labs, shops, lecture rooms, etc.)

Parking area requirements

Requirements for telephone service

Lighting, elevators,mechanical services, etc.

Details on equipment and furniture requirements

Detailed list of spaces with number of occupants, area required and other details for all parts of the college

The Site

"Subject to the approval of the Minister upon the recommendation of the Council of Regents, the Board of Governors shall select the site or sites of the college."
Regulation 5

Selection
The choice of the site should be very carefully made as this will affect the design and cost of the college buildings and its relationship to the life of the community.

Location
Suitable location for area served

Effect of "commuter" philosophy and emphasis on part-time adult education on location of site

Availability of services (water, sewers, gas, electricity, etc.) at reasonable cost

Accessibility to public transit services

Accessibility to roads, etc.

Co-ordinated into the community plan relating to the business, municipal and recreational activities of the community

Size
Sufficient in area to accommodate future as well as present building needs

Space for recreation and sports activities

Space for present and future parking

Possibility for acquiring additional space in the future

Cost of land

Before purchase
Check site suitability

Check easements and rights of way, accessibility to roads and transit

Check ownership, etc.

Obtain survey and soil tests

Negotiate costs

Purchase

Characteristics
Reasonable soil conditions for building

Free from problems of flooding

Free from underground and overhead easements for gas, water, hydro, sewers, etc.

Free of mining tunnels, underground water, etc.

Free of excessive noise, dust, traffic congestion, etc.

Where possible avoid sites requiring

Excessive excavation, hauling or blasting

Special footings and piling

Special service installations due to distance from public utilities

Necessity to build large amounts of roads and driveways

Development
Check access and egress points with the Department of Highways

Plan for best land use

Locate buildings, parking, etc. in correct relationships

Plan for future as well as present requirements

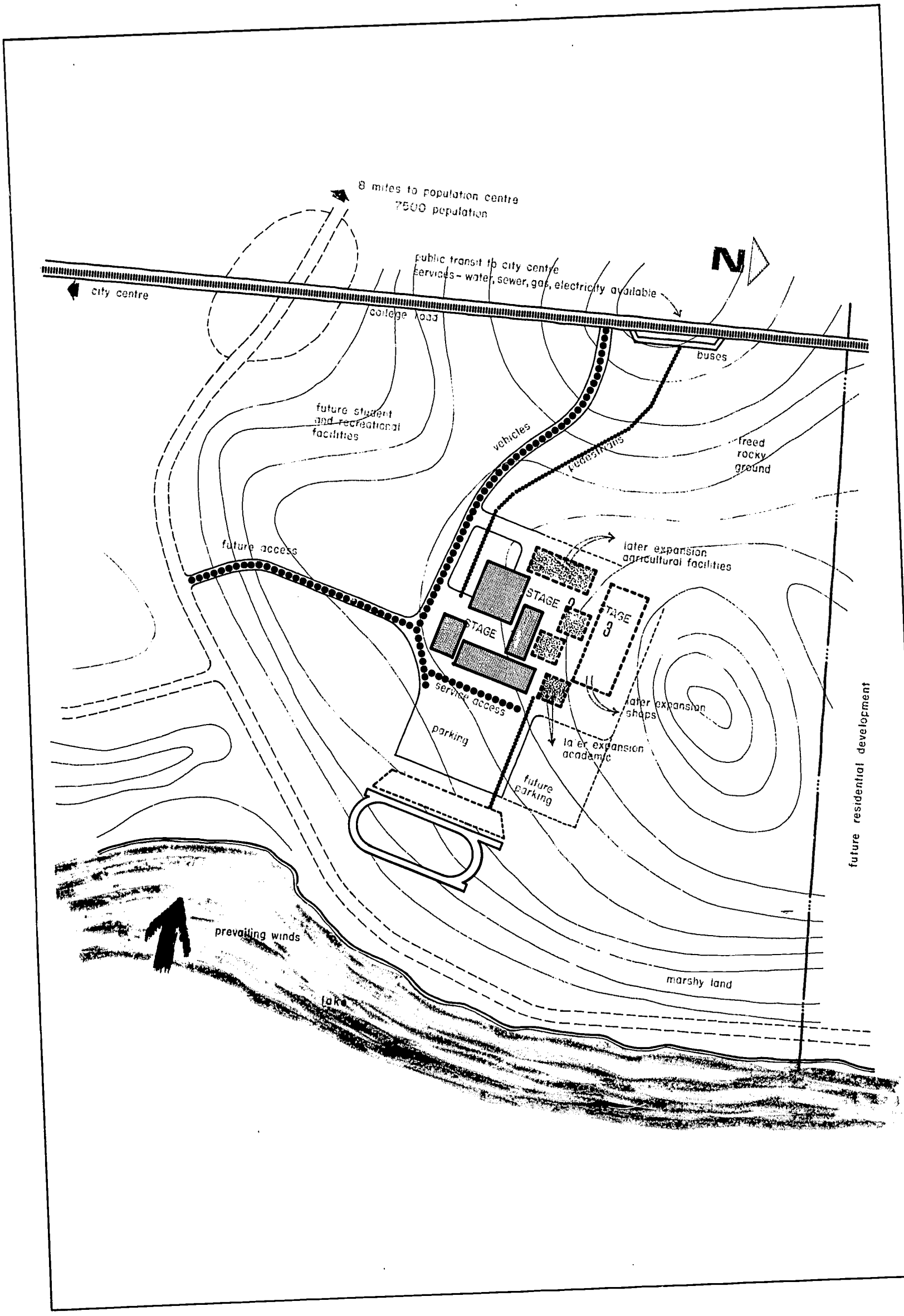
Orientate buildings properly

Orientate playing fields properly

Utilize advantages, vegetation and natural features of site

Site Analysis Plan

Chart 6



Planning

General
Design and plan for flexibility; keeping in mind that programs and requirements may change over the years. Teaching methods will alter and equipment and service requirements will have to be frequently updated. These anticipated changes must be allowed for at the master planning stage.

Anticipate future needs and make allowances for them at the initial stages.

The structural system should be designed to accommodate easy rearrangement of space in the building.

Plan for multiple use of space for day and night classes.

Design floor loading to accommodate space rearrangement.

Allow for addition of an extra storey at the structural design stage.

Design for increase in floor areas at the same level.

Make ample provision for future services on site and in the building.

The overriding consideration in planning the areas for these educational programs is to keep in mind that each area has specific requirements and that each area and unit must be designed for its particular function. The program may vary with the needs of each community and the instructional methods employed. The building should express these factors and grow from these requirements rather than be a concept into which the requirements can be forced.

Traffic
Prepare studies on traffic in relation to the community and site:
Within the site

Within the building

Planning suggestions

Local authorities
Consult at an early stage and also as planning progresses with:
Local Planning Department

Municipal Engineers office

Highways Department

Local Health Department

Ontario and Local Fire Marshals

Area and space relationships
Plan proper relationship of areas to facilitate movement from one area to another and minimize noise and confusion during class changeovers.

Group noisy or dirty areas together and provide good separation (physical, accoustical, etc.) from areas where quiet is required.

Plan for easy servicing, and for movement of supplies and equipment.

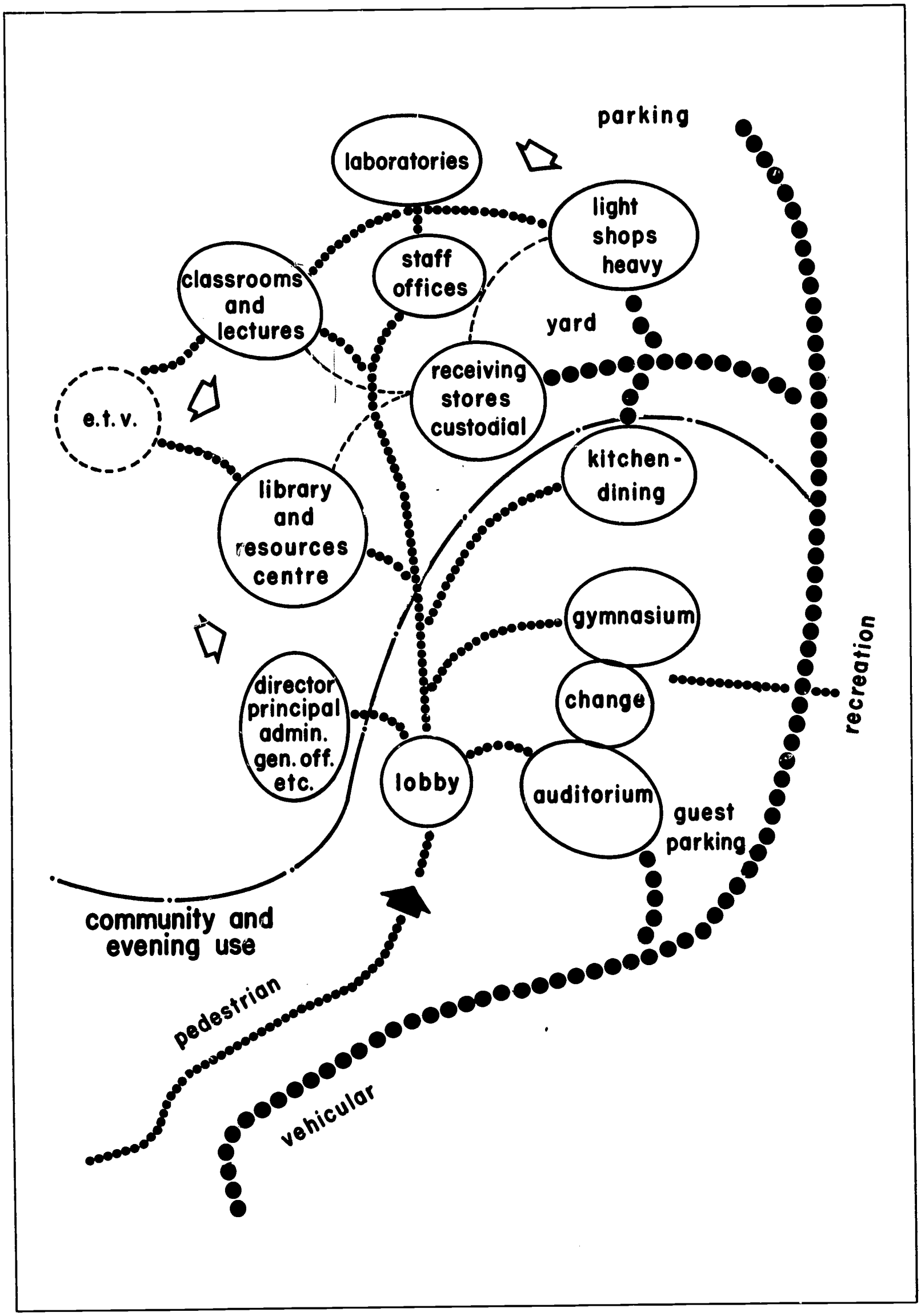
Plan specific areas correctly in area and form to suit their function.

Plan correct zoning of building for the various programs. Locate common areas, libraries, etc., for easy access to all students.

Plan auditorium, gymnasium, dining areas, etc. for easy access as community facilities with direct access from outside and nearby parking.

Space and Circulation Patterns

Chart 7



Main planning steps

Feasibility study and assess area needs
Board of Governors

Prepare educational proposal
Board of Governors

Appoint educational consultants
Board of Governors

Prepare critical path program
Board of Governors DSP & BR

Research & study similar projects
Board of Governors DSP & BR

Prepare educational specs.
Board of Governors AA & T

Appoint planning consultant and architect
Board of Governors

Select & purchase site
Board of Governors

Prepare plant specs.
Architect DSP & BR

Prepare master plan, land use plan, etc.
Planning Consultants and Architect

Prepare design drawings & estimates
Architect

Prepare working drawings, specifications, cost estimates and contract documents
Architect and Consultants

Call Tender
Board of Governors
(with Minister's approval)

Erect building
Contractor – Sub-Contractors

Prepare colour schemes, select furnishings, etc.
Architect

Building takeover
College

Steps for planning

Preparatory steps
Prepare area study
Board of Governors

Study area requirements
Board of Governors

Assess area enrolment
Board of Governors

Appoint standing committees
Board of Governors

Preliminary steps
Prepare feasibility study
Board of Governors

Appoint President and Senior Staff
Board of Governors

Prepare general proposal
(for approval of Minister)
Council of Regents

Appoint educational consultants if required
Board of Governors

Prepare detailed educational proposal
Board of Governors

Obtain professional assistance in site selection
Board of Governors
(Surveyor and/or Architect)

Select site, take out option and negotiate purchase
Board of Governors

Research and study similar projects
Board of Governors

Develop educational specifications
Board of Governors

Appointing consultant services
Appoint planning consultants
Board of Governors

Appoint architect
Board of Governors

Prepare plant specifications
Architect

Preliminary planning stage
Obtain detailed site survey
Board of Governors (Surveyor, Architect, Master Planning Consultant)

Study site services and requirements
Master Planning Consultant, Architect

Obtain soil tests and other site characteristics
Master Planning Consultant, Architect

Study roads traffic and access requirements with Highways Dept.
Master Planning Consultant, Architect

Prepare land use plan
Master Planning Consultant, Architect

Prepare Master Plans to accommodate present and future needs
Master Planning Consultant, Architect

Prepare preliminary studies and sketches of buildings
Architect

Prepare cost estimates
Architect

Study structural concepts
Architect and Engineer

Prepare requirements and advise on sketch layouts of special areas
College Staff

Prepare furniture and equipment requirements
College Staff

Final planning stage
Prepare final design drawings and estimates
Architect

Establish structural system foundations, etc.
Architect, Structural Engineer

Check and approve design drawings and cost estimate
Minister

Prepare preliminary working drawings
Architect

Select materials and finishes
Architect

Prepare final working drawings and specifications, consultants' drawings and specifications and contract documents
Architect, Consultants

Approve final working drawings, specifications and contract documents
Minister

Preparations for building
Call tenders
Board of Governors (architect)

Select contractors
Board of Governors (architect)

Establish building schedules
Architect, Contractor
Division of School Planning

Order furniture and equipment
Board of Governors and College Staff

Construct building
Contractor, sub-contractor

Preparations for operation
Appoint staff
Board of Governors

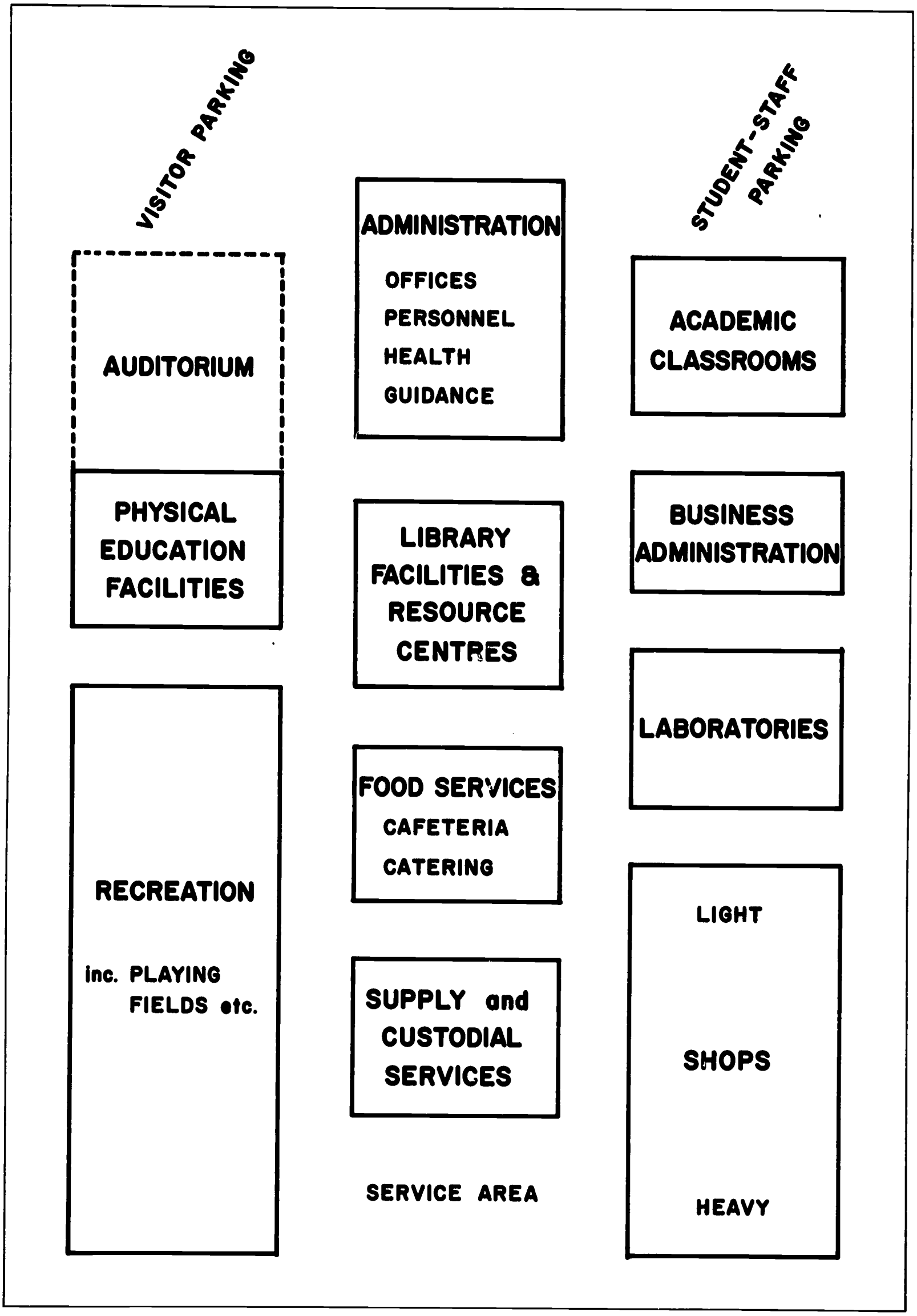
Prepare for takeover of building
Board of Governors,
College President and Staff

Prepare for enrolment of students
College Staff

After operation
Prepare comments on building's performance and make suggestions for future project of this nature to the Department of Education
College President

Space Relationships and Planning

Chart 8



Considerations for planning

Wherever possible educational areas should be planned for shared use by the various programs within the College

Noisy areas (such as some of the shops) should be separated from academic areas.

Shops and labs should be designed to minimize the possibility of personal injury to occupants – damage to equipment – and to permit good visibility for class supervision.

Arrange easy direct access to shops for bringing in equipment and supplies.

Heavy shops should be located at ground level preferably in one storey buildings.

Light shops may be located on upper floors near labs.

Storage areas in shops should be located so that supplies can be brought in with little disturbance. Also easy access for materials from storage to shop should be planned.

Sizes and shapes of shops will depend on their function. Areas are often required within shops for project assembly, lectures and student project storage.

Labs and shops should be planned without protruding columns or other structural members.

Ceiling heights will vary to suit the particular function of the shop or lab.

Structural allowances should be made for overhead cranes or hoists.

Two doors are required from shops and labs – overhead access doors are also required in most shops.

Each shop should have a washbasin with hot and cold water, a drinking fountain and student book and coat storage space.

Special storage areas are required for precision instruments.

Plan for easy removal of waste from shops and labs and for adequate space for collection of waste awaiting removal.

Floor drains should be located in all shops.

Display cases for students work should be provided in circulation areas.

Safety precautions and equipment
Proper fire extinguishers are required in all shops and labs.

Hazardous machines must be equipped with safety guards and guard rails.

Circulation and warning markings should be painted on floors and equipment.

Master switches and controls for all electricity, water, gas, etc. should be provided near the door in a lockable panel. Pilot lights should be provided in both the lab or shop and in the corridor.

Safety switches for emergency should be provided throughout the shop or lab.

Switches for all machines and equipment should be of the safety type and correctly placed to avoid accidental contact.

All machines, motors and electrical equipment should be grounded – (check electrical code).

Adequate provision should be made for safety, handling oil, paint, waste materials, etc.

Exhaust must be provided for all gasoline or diesel engines – underfloor exhausts must have drainage outlets.

Dust collecting systems are required for wood-working machines.

Economies in planning

General
Allow enough time for adequate planning at each step to avoid the need for hasty unverified decisions.

Avoid changing requirements and needs after planning commences.

Get good professional assistance at all stages.

Purchase buildings to be renovated, in time for proper planning and tendering.

Anticipate realistically future trends and requirements.

Provide ample receiving area, central stores, departmental stores.

Plan for easy access and servicing of the building.

Site
Select and finalize site purchase, at an early stage.

Select site without difficult topography and poor soil conditions.

Ensure that all services required are available at the site.

Purchase enough land to accommodate future needs.

Keep roads and paths to a minimum.

Avoid the need for long expensive service connections.

Building
Plan and design buildings to suit the site.

Avoid using complicated and costly structural systems.

Avoid elaborate design features.

Avoid using materials that require constant maintenance and refinishing.

Allow sufficient trunking for present and future services.

Avoid load bearing walls which may be impossible or costly to remove when later changes in plan may be required (if they have to be left in place they will make for inefficient use of space).

Materials
That are prefinished

That can be used as they are and do not require additional finishes
(e.g. concrete T slab ceiling)

Equipment and Furniture
Select simple hardwearing furniture.

Select from well established lines so that the same designs can still be purchased when required later.

Locate equipment requiring maintenance in accessible locations.

Select equipment of good reputation and designed for easy repair and maintenance.

Maintenance
Select building materials for hard wear and low maintenance.

Plan for regular maintenance of exterior and interior of building.

Plan for preventative maintenance.

Check maintenance regularly.

Critical Path Planning and Time Scheduling

It is recommended that all planning from the concept stage onward be done with the aid of a critical path planning chart to ensure complete co-ordination and timing.

Explanation

A critical path diagram for a building is a chart showing all the steps, from the original concept, through construction to completion and hand over.

The project is broken up into the major individual activities necessary to complete it, and each activity is represented by a line. These are arranged in their general sequence with those which can be done simultaneously drawn parallel to each other.

On completion of the diagram, the time required to complete each activity is established and written in its respective place on the diagram. These times are totalled along all possible paths through the diagram from beginning to end. Following the sequence of operations, the path requiring the longest time to complete is the *critical path*.

These activities must be completed on schedule if the project is to be completed on time.

After finding the length of time required for completion of the project, it is possible to establish a starting and completion time for each individual activity and these times are shown on the diagram. Many of the activities not on the critical path will have more time than necessary for their completion.

Each step of activity is designated by two numbers used for reference. Many activities shown on the diagram can be broken down further e.g. construct building (40-41) can be divided up into excavate foundations, pour foundations, build walls, etc., and the contractor should be encouraged to prepare a critical path diagram to expedite his work.

Advantages of method

The major advantages of the critical path method over other timetabling systems is that it will show clearly and quickly:

- all the activities which make up the complete project
- over-all time of the whole project
- each individual activity in the project
- length of time required to carry out each activity
- activities which have to proceed simultaneously
- time for starting and completing each activity
- those responsible for each activity
- progress of the project at any given time.

Consultants

Consultants/Architect/Engineers

	Will advise on	*Works with*
Educational consultants Appointed by Board of Governors Responsible to Board of Governors	curriculum teaching methods equipment layouts of areas TV etc.	Board of Governors AA & T Branch DSP & BR College President
Planning consultants Appointed by Board of Governors Responsible to Board of Governors	land use traffic patterns master planning building phasing building needs building planning	Board of Governors AA & T Branch DSP & BR College President Architect Engineering Consultants
Architect Appointed by Board of Governors Responsible to Board of Governors	Building concepts structural concepts mechanical requirements electrical requirements services building costs tendering procedure change orders	Board of Governors AA & T Branch DSP & BR College President Engineers Landscape Architect Contractors Subcontractors
Structural engineer Appointed by Architect Responsible to Architect	structural systems calculations and drawings	Architect
Mechanical Engineer Appointed by Architect Responsible to Architect	mechanical, ventilation and air conditioning requirements & installation	Architect
Electrical Engineer Appointed by Architect Responsible to Architect	electrical requirements installation circuits etc.	Architect
Quantity Surveyor Appointed by Board of Governors (or Architect) Responsible to Architect	construction economics, estimates of cost, cost planning, post contract cost control	Architect Engineers Contractors

Costs

Debentures and financing

The capital funds for the Colleges of Applied Arts and Technology will be provided through the Ontario Universities Capital Aid Corporation.

When the amount of the project has been approved a college will be required to pass a resolution by the Board of Governors of authorization in the creation of debentures. The college will then subsequently issue debentures in various amounts as the capital funds are required for the project rather than having one debenture for the total amount. The payments of the annual instalments of the debentures will be arranged through the estimates of the Department of Education which will provide the necessary funds to meet the debenture instalments as they become due.

Detailed information in this regard can be obtained from the Director of Financial Administration, Department of Education.

Cost determination

Building Cost Estimates
The architect advises the college on building costs, but in large or complicated projects a consulting quantity surveyor may be engaged to prepare:

Master plan estimates

Project estimates

Cost plans

and to negotiate the cost of change-orders.

Master plan estimates should show the costs of each stage or phase of college development. All costs should be at the prevailing cost for the first stage.

Project estimates must show an analysis of cost, and the costs must be those anticipated at the time of bidding —

Site improvements

Roads and paving

General construction

Heating, ventilating

Plumbing

Electrical services

Other services (air-conditioning, etc.)

Built-in equipment

Contingencies

Architect's and consultant's fees

Estimates of cost of small projects may be calculated as a cost per square foot or cost per student place. Estimates of large or complicated projects must be more reliably calculated by means of priced measurements from the architect's drawings. In such cases cost-planning is advisable wherein the detailed measurements and prices are regularly amended to suit changes in concept, layout, materials, etc., and to agree with the development of the architectural and engineering drawings.

Cost Factors
The cost of the building will be adversely affected by:

Insufficient or unreliable information to the architect

Changes in requirements during planning (or worse, during construction)

Slow decision making

Delays in approving drawings

The cost of the design will depend primarily upon:

Types and quantity of accommodation

Ratio of instructional areas to the overall area

Extent of site improvements, roads and paving

Availability and location of service mains (sewers, water, electricity, etc.)

Foundation requirements

Structural frame, provisions for enlargement

Building layout and number of storeys

Predominant construction materials

Finishes, internal and external

Heating, ventilating, air-conditioning requirements

The bidding will be influenced by:

Amount of other work available to contractors

Seasonal working conditions

Availability of local labour, wage rates

Use of locally available materials

The ultimate cost of the project will reflect:

Amount of technical equipment

Scale of furnishing

Board of Governors' aspirations

First Cost Versus Annual Cost
Balance initial construction costs against life expectancy, performance, repairs and maintenance. The design, materials, finishes and services must take account of these long term costs.

Approval of Building Cost Estimates
Estimates of cost are submitted as part of the requests for:

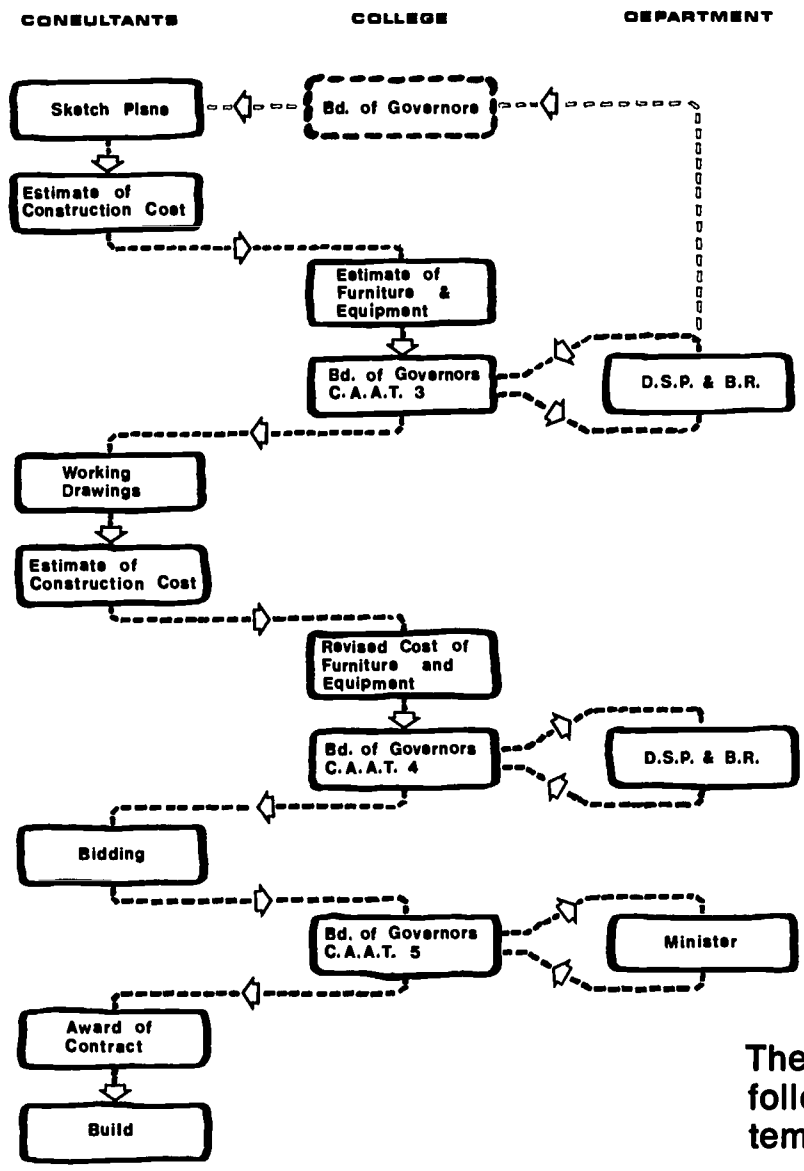
Approval of sketch plans (Form C.A.A.T. 3)

Approval of working drawings (Form C.A.A.T. 4)

Both estimates will be examined by SP & BR and, if necessary, revised by the architect.

Both estimates will be approved by the Minister.

Actual expenditure upon the building project must be within the approved working drawing estimate.



These steps must also be followed when planning temporary accommodation.

List of Approvals

Chart 9

FORMS TO BE USED		
CAAT 1 CAAT 2	APPROVAL IN PRINCIPLE	MINISTER OF EDUCATION
	FINAL APPRAISAL OF EDUCATION SPECS	A.A. & T. BRANCH D S P. & B.R.
	FINAL APPRAISAL OF PLANT SPECS	A.A. & T. BRANCH D S P. & B.R.
	APPROVAL TO PURCHASE LAND	MINISTER OF EDUCATION
	APPRAISAL OF ARCHITECT'S SKETCH DESIGN & ESTIMATE	BOARD OF GOVERNORS
CAAT 3	APPROVAL OF FINAL DESIGN DRAWINGS & ESTIMATE	MINISTER OF EDUCATION
CAAT 4	APPROVAL OF FINAL WORKING DRAWINGS & ESTIMATE	MINISTER OF EDUCATION
	APPROVAL BY MUNICIPALITY FIRE MARSHAL, DEPT. OF HEALTH, ETC.	THE ARCHITECT
CAAT 5	APPROVAL TO BUILD	MINISTER OF EDUCATION

Standard Forms

Forms
The following 5 forms are required for approvals and are to be completed and submitted as the project progresses, along with any necessary drawings, lists, tenders or other documents. The stages of work requiring these approvals are shown on chart 9

Prepared by
Completion of the forms is the responsibility of the chairman of the Board of Governors. He will sign them and obtain the signature of the College President and forward them to the Applied Arts and Technology Branch, Department of Education, who will obtain the necessary approvals.

Forms are to be submitted in duplicate.

Forms will be obtainable from the Applied Arts and Technology Branch.

Ontario Department of Education

44 Eglinton Avenue West, Toronto 12, Ontario

Date _____

CAAT1
Request for
Approval in Principle

Director
Applied Arts and Technology Branch
55 Eglinton Avenue E. 6th Floor
Toronto Ontario

Dear Sir: _____

Approval in Principle for a Capital Building Project is requested for:

College _____

Name of Capital Project _____

Location _____

Estimated Total Expenditure _____

Financial Data

1. Present Capital Debt $ _____

2. Other Capital Liabilities $ _____

3. Present Annual Debenture Payment $ _____

4. Capital Funds on Hand $ _____

Total Enrolment and Staff in the College

Academic Session	Students	Teaching Staff	Other Staff Remarks
1967-68			
1968-69			
1969-70			
1970-71			
1971-72			
1972-73			

Description of Project

A full description of the project is attached under the following headings:

a) General
b) Need for Project
c) Academic Considerations
d) Architectural Considerations
e) Summary of Facilities:
A tabulated list of all assignable rooms, their areas, their principle use, the number of student stations in each (where applicable).

side 1

Description of Project – continued

f) Summary of Space Utilization Studies:
undergraduate and graduate enrolment and the student lecture hours.
The proposed room period use
g) Staff Accommodation: Office and Workroom space

College President date Chairman of Board of Governors date

To be completed and submitted in duplicate side 2

Ontario Department of Education

44 Eglinton Avenue West, Toronto 12, Ontario

Date _____

CAAT2
APPROVAL
IN PRINCIPLE

Dear Sir: _____

College _____

Ref. & File No. _____

Name of Capital Project _____

Location _____

Approval in Principle for Preparation of Preliminary Sketch Plans for this Project, Subject to the following Conditions and Comments:

That form CAAT3 requesting Approval of sketch plans will be submitted to the Director of Applied Arts & Technology Branch.

That the following will accompany form CAAT 3:
a) Two sets of preliminary drawings,

b) outline specifications for building services, structural systems and finishes

c) **Detailed Construction Budget,**

d) detailed furnishing and equipment budgets

e) copy of letter of preliminary approval of the preliminary drawings from The Ontario Fire Marshal

f) That title to the site will be obtained before starting construction

g) That the total amount of financial assistance to be provided through The Ontario Universities Capital Aid Corporation be determined when a contract price has been received.

Comments: _____

_____

_____

_____

_____

Director, AA&T Branch

To be completed and submitted in duplicate

Ontario Department of Education

44 Eglinton Avenue West, Toronto 12, Ontario

CAAT3
APPROVAL OF
SKETCH PLANS

Date _____

_____

_____

Dear Sir: _____

Name of project _____

Ref. & File No. _____

Architects job ref. _____ Drawing Nos. _____ Dated _____

Gross area of building calculated from sketch plans — Phase 1 — Phase 2

Anticipated Enrolment total _____ — Full Time — Part Time

At Opening: _____

After 5 years: _____

Net areas of:

1. Functional educational areas (classrooms, labs, shops, lecture rooms, seminar rooms, electronic teaching areas, gymnasiums & change rooms) _____
2. Library & Educational Resource Centre include reading area, open stack area only — (offices and work rooms to be included in 5) _____
3. Students washrooms & rest rooms _____
4. Cafeteria-kitchen, food preparation area, food storage and washup areas — Seating area only a) _____ Remainder b) _____
5. Administration offices, teachers' offices, teachers' lounges, prep rooms _____
6. Circulation (lobbies, corridors, stairs, elevator shafts) _____
7. Storage areas, central, departmental, janitors, etc. _____
8. *Mechanical space (boiler rooms, mechanical rooms, duct risers, etc., except special requirements for auditorium & swimming pool) _____
9. *Auditorium including dressing rooms, stage, projection rooms, control rooms, etc. (main floor and any mezzanines or balconies) _____
10. Students' recreation rooms, council rooms, student magazine, etc. (shared activities areas) _____
11. Students' health rooms, guidance rooms _____
12. Others not specified _____

Total net area _____

*Note:
Auditorium net areas to include all specially required mechanical & equipment rooms, lobbies, washrooms, etc. and to be calculated as completely self-contained units.

To be completed and submitted in duplicate

side 1

Cost breakdown:

Building cost		$ _____
Services cost (mechanical-electrical, plumbing drainage, air-conditioning).		_____
Site Development (landscapping, parking lots, roads, paths, outdoor lighting and signs)		_____
Built-in equipment in contract		_____
Loose equipment, furnishings Draperies, etc.		_____
	Total – a)	$ _____
Contingency 3% of total – a)	Total – b)	$ _____
Fees: Architect		_____
Engineering consultants		_____
Other consultants		_____
	Total – c)	$ _____
Cost expected at date of tendering	Gross cost a + b + c	$ _____
Expected date of tendering		_____
Describe briefly method used to determine costs		_____

_____

_____

_____

_____

Outline Construction details

Foundation type	_____
Structural frame (steel conc., etc.)	_____
Walls, materials	_____
Roof materials	_____
Extent of grading works required	_____
Air Conditioning & services	_____

The above information has been completed and approval is requested.

_____

College President date Chairman of Board of Governors date

The preliminary sketch plans & estimates have been approved. You should now instruct the architect to start preparation of final design drawings on the basis of these approved drawings.

_____

Minister date

For official use only. side 2

Ontario Department of Education

44 Eglinton Avenue West, Toronto 12, Ontario

CAAT4
APPROVAL OF
WORKING DRAWINGS

Date _____

_____

_____

_____

Dear Sir: _____

Name of project _____

Ref. & File No. _____

Architects job ref. _____ Drawing Nos. _____ Dated _____

	Phase 1	Phase 2
Gross area of building calculated from sketch plans		
Gross area of building calculated from working drawings		

Net areas of:

			Phase 1	Phase 2
1.	Functional educational areas (classrooms, labs, shops, lecture rooms, seminar rooms, electronic teaching areas, gymnasiums & change rooms)			
2.	Library & Educational Resource Centre include reading area, open stack area only — (offices and work rooms to be included in 5)			
3.	Students washrooms & rest rooms			
4.	Cafeteria-kitchen, food preparation area, food storage and washup areas	Seating area only a)		
		Remainder b)		
5.	Administration offices, teachers' offices, teachers' lounges, prep rooms			
6.	Circulation (lobbies, corridors, stairs, elevator shafts)			
7.	Storage areas, central, departmental, janitors, etc.			
8.	*Mechanical space (boiler rooms, mechanical rooms, duct risers, etc., except special requirements for auditorium & swimming pool)			
9.	*Auditorium including dressing rooms, stage, projection rooms, control rooms, etc. (main floor and any mezzanines or balconies)			
10.	Students' recreation rooms, council rooms, student magazine, etc. (shared activities areas)			
11.	Students' health rooms, guidance rooms			
12.	Others not specified			
		Total net area		

*Note: Auditorium net areas to include all specially required mechanical & equipment rooms, lobbies, washrooms, etc. and to be calculated as completely self-contained units.

To be completed and submitted in duplicate

side 1

Estimated total cost of building from CAAT3 $ _____

Cost breakdown

Building cost _____

Services cost (mechanical-electrical, plumbing, drainage, air-conditioning) _____

Site development
(landscaping, parking lots, roads, paths, outdoor lighting and signs) _____

Built-in equipment in contract _____

Loose equipment, furnishings
Draperies, etc. _____

Total a) $ _____

Contingency 3% of total – a) Total b) $ _____

Fees: Architect
Engineering consultants
Other consultants _____

Total c) $ _____

Cost expected at date of tendering Gross Cost, a + b + c $ _____

Expected date of tendering _____

Describe briefly method used to determine costs

_____

_____

_____

Outline construction details

Foundation type _____

Structural frame,
steel conc., etc. _____

Wall, materials _____

Roof materials _____

Extent of grading works required _____

Air conditioning & services _____

The above information has been completed and approval is requested.

_____

College President date Chairman, Board of Governors date

Final working drawings and estimates have been approved. You should now instruct the architect to finalise all necessary contract documents on the basis of these approved drawings

_____

Minister date

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Ontario Department of Education

44 Eglinton Avenue West, Toronto 12, Ontario.

Date _____

CAAT5
APPROVAL TO BUILD

Dear Sir: _____

Name of project _____

Ref. & File No. _____

Estimated total cost of building from CAAT3 _____

Total cost approved from CAAT4 _____

List of all tenders to be attached (contractor's name and contract sum)

Tender recommended by Board of Governors _____

_____

ref. _____ dated _____ to the amount of $_____

List all other items not included in this tender with estimated or actual cost.

building ☐ _____

services ☐ _____

fixtures & fittings ☐ _____

equipment ☐ _____

landscaping ☐ _____

other - specify: _____

College President date Chairman Board of Governors date

(To be completed and submitted in duplicate)

The above documents have been approved and contract may now be awarded subject to

Minister date

For official use only

Glossary

Architect
The architect is responsible for the planning, design, co-ordination and supervision of the building. Engages and co-ordinates work of consultants, engineers and builders in relation to the building design. Prepares tender documents, supervises construction. Prepares certificates of payments to contractor on basis of work carried out. Paid by fees on a basis set by Royal Architectural Institute of Canada.

Assembly Area
An area within the school shop, free of machinery and equipment, where the component parts of large instructional projects can be assembled.

Auditorium
An area equipped with seating, stage, lighting, projection booth, etc. used for lectures, extra curricular activities and community use. Should be flexible and designed to suit these different requirements. Plan close to gym dressing rooms where possible.

Auxiliary Facilities
Rooms or other facilities in or adjacent to the shop area which are used for special purposes; e.g., toilets, dressing rooms, offices, visual aid rooms, storage rooms, and rooms or booths for painting, sanding, drying, welding and the like.

Carrell
Semi-enclosure or cubicle for individual study, usually in a stackroom or reference room of a library.

Class
One or two class units.

Classroom
Room provided with seats and writing areas, accommodating a unit group of students. (Unit Instructional group up to 30 students.)

Class Unit
Smallest group of students for instructional situations, usually determined by the size of the group accommodated in laboratory or shop classes. (20 to 30 students.)

College of Applied Arts and Technology
See basic documents
A post secondary educational institution established to provide opportunities for youth and adults to continue their practical and formal education in a wide variety of fields in courses varying in length from a few weeks to 3 years.

Computer Centre
Area provided with a computer, data processing and supporting equipment for use by the administration, faculty and students.

Consultant
See section 9
A specialist in a particular field appointed to advise and assist in the preparation, planning or carrying out of particular parts of the work. Paid by fee.

Course of Study
The content of individual subjects or courses that constitute a program of instruction.

Custodial Area
Area for maintenance staff and equipment generally includes staff change rooms, washrooms, restrooms and lockers for male and female staff. Storage rooms for cleaning equipment and materials for internal and external use. Prepare exact requirements.

Department
An organizational sub-division of a college Division such as Mathematics, Social Science, Electronics Technology, Business Administration, etc., depending on enrolment; each supervised by a chairman under the direction of a division head.

Division
A major area of instruction such as Technological and Technical, Business, Applied Arts, Extension, etc.; each supervised by a principal or chairman (depending on enrolment) under the direction of the president of the College.

Educational Specification
See section 5
Detailed written description of education program, philosophy and facilities needed to meet the program.

Electronic Teaching Room
Equipped with tape recorders, microphones, earphones and ancillary equipment by which the instructor may be in direct contact with each student or with a group of students. i.e. language laboratory and dictation room.

Engineers
Specialists appointed by architect to prepare calculations and drawings for the electrical, mechanical, structural, etc. portions of the building. Responsible to the architect who co-ordinates their respective parts of the work with the building plans. Paid by fee.

Educational Proposal
A written document describing the details of educational program requirements of type of College to be established.

Finishing Room
An enclosed area, within or adjacent to a shop, which is used for spraying or painting projects or materials.

Gymnasium
Space used in Physical Education Program. Special finishes on walls, floors and ceiling to take hard wear and rough usage. To have adequate storage rooms fitted with shelving, etc. to accommodate all required equipment. Change rooms, showers and instructors rooms are a necessary part of this facility.

single – generally in the region of 40′ x 60′

double – generally in the region of 60′ x 100′

Instructional Area
As applied to a shop, an area within the shop usually equipped with tables, chairs, instructor's demonstration desk, book cases, and equipment which the instructor and groups of students may use for study and instruction or technical topics which are incidental to the shop instruction. The instructional area can be incorporated in the planning area.

Instructional Material
A general term usually applied to all forms of printed materials used in instruction – including textbooks, reference books, trade journals, shop manuals, catalogs, student study guides, blueprints – as well as audio-visual and other materials used in the teaching-learning process.

Laboratory
Room furnished with specialized equipment and instruments purposely designed to prove the principles discussed in lecture and classrooms and designed to develop testing and research techniques.

Land Use Plan
See section 6
Indicates in general terms the best use of the land and the relationship of the various parts of the College. Indicates services and transportation – best location for all the parts and takes into account long term planning.

Lecture Group
Four, six or other even multiple of class unit

Lecture Room
Room providing lecture-type seats with arms accommodating up to 60.

Lecture Theatre
Room provided with tiered rows of seats accommodating large groups of students. (120 students plus, usually even multiples of the class unit.) Rooms are usually designed with built-in projection equipment and facilities for other visual aids.

Library
Centralized
All books and services are located in one area

Decentralized
One central area containing books used by all divisions of the college with a number of smaller areas in readily accessible locations containing specialized reference material.

Other
One central area with specialized books assigned to instructors in specialized areas; the latter are for the use of students in laboratories, design rooms and seminar rooms.

Master Plan
See section 5
Plan (developed from the land use plan) to indicate present and future development of the college to ensure that all the parts are correctly related at all stages.

Mechanical Systems
Heating, ventilation, environmental control, etc. in the building.

Offices
General
Space containing secretarial, stenographic and clerical staff, general files. Provided with an enquiry counter, waiting area with seats, storage and reproduction areas.

Shared
Space for 2 or more staff members to prepare work, should be near their departments with easy access to the Library, resource centre and computer centre.

Physical Education Program
An organized program for the development of physical recreational interests.

An organized program for the training of instructors in Physical Education and recreational activities.

Planning Area
An area within the shop, equipped with tables, drawing equipment, reference materials, and the like, which is used by students and instructor for planning and laying out instructional jobs or projects. The planning area can be incorporated in the instructional area.

Prep Room
Area adjacent to a shop or lab for preparing instructional materials mainly used by teaching staff.

Program of Instruction
A group of selected subjects leading to educational goal e.g. Electronics Technology, etc.

Recreational Facilities
Includes gymnasium, playing fields and similar areas. May be used by students and community. Make provision for these requirements.

Resource Centre
An area used for the storage and use of information material other than books. These at present consist mainly of audio and video tapes, slides, film strips, records, etc. Properly designed storage should be provided for all these items. Space for viewing, listening to the material, etc. is necessary; these are placed adjacently in carrels or variously sized rooms which are also used for seminars and small instructional groups. This area is used in close conjunction with the library and in many cases is part of it. Materials are used by students and staff and as part of the community facilities. The resource centre will play an increasingly important part of the educational program and will expand to include a larger and wider selection of material. Provision for closed circuit TV and future computer-assisted learning should be considered.

Safety Zone
A zone around a machine or work area, usually outlined with a painted stripe on the floor, outside of which a person is safe from possible injury.

School Plant
The total physical facilities of a school, usually confined to one campus or general area.

Seminar Room
Room with moveable seats usually arranged around tables to accommodate group discussions under the leadership of a resource person or instructor (12 to 24 students).

Service Entrance
A door or entrance large enough to admit a delivery truck.

Shop, Heavy
A term sometimes used to indicate a shop requiring large and heavy items of equipment.

Shop, Light
A term used to indicate a shop, such as commercial arts and radio shop, in which little, if any, heavy equipment is required.

Shop Area
The total area of a shop used for instructional purposes, exclusive of classroom, wash room, toilets and the like.

Sketch Plan
A rough sketch showing the general concept of the project; prepared by the Architect. It does not generally go into great detail.

Studio
A room without fixed furniture designed specifically for practical work in the creative arts.

Supplies
Those expendable items which are necessary for shop instruction but which do not necessarily become a part of a job or project; e.g., fuels, lubricants, abrasives, cutting tools, files, small drills, fastening devices, pencils, erasers and similar supplies.

Tender
Prices submitted by contractors on the building equipment, furnishing or materials for the College. Based on Tender Documents, drawings and specifications.

TV (Educational)
Closed Circuit
Designed for transmitting educational and other programs within the confines of the institute, college or school. Cameras are connected directly to the receiver circuits.

Open Circuit
Designed to reach limited or large community audiences with professional, formal and informal programs involving the operation of an educational or commercial television station. Programs can be received on a regular TV set.

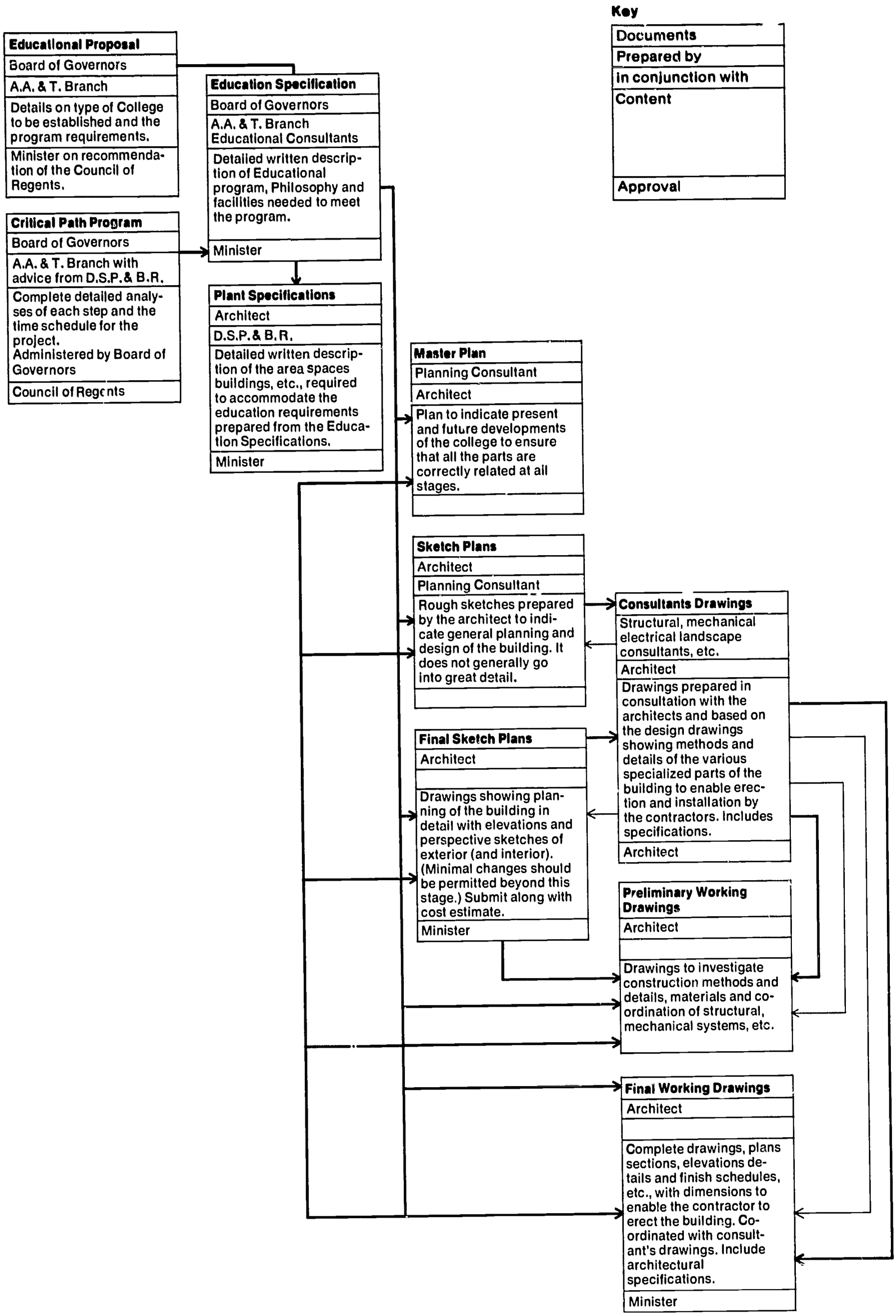
Utility Machine
A machine for general use in any type of shop work, including shop maintenace; e.g., drill press, grinder, etc.

Work Station
A location within the shop which has the necessary facilities for one student to work as a part of his daily instruction; e.g., individual machines (exclusive of utility machines), work benches and tool rooms. A shop must have at least as many work stations as there are students enrolled in a given class.

Working Drawings
Drawings prepared by the architect and engineers to enable the contractor to construct the building and ensure the co-ordination of all parts of the work. Used as part of the tender documents. To be used along with specifications. (15 sets of Working Drawings and Specs will be provided by the architect — additional sets available at a charge.)

Documents and Content

Chart 10



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